

be added to the application by this Amendment.

Status of the Claims

Claims 1 and 3-13 are pending in the application.

Rejections Under 35 U.S.C. §103(a) (paragraphs 2-10 of the Office Action)

Claims 1, 3-5, 7-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being obvious over EP '121 (EP 716121) in view of Sadatoshi (U.S. Patent No. 5,340,878) and either Yamamoto (U.S. Patent No. 5,656,696) or JP '656 (JP 54120656). Claim 6 is rejected under 35 U.S.C. §103(a) over EP'121 in view Of Sadatoshi, Yamamoto, or JP '656, and further in view of Yoshimura (U.S. Patent 5,443,765). Claims 1, 3, 5, 7 and 8 are rejected under 35 U.S.C. §103(a) over Sugano (U.S. Patent 5,468,781) in view of EP'121, Yamamoto, or JP '656. Claim 6 is rejected under 35 U.S.C. §103(a) over Sugano in view of EP'121, Yamamoto or JP '656, as applied in paragraph 5 of the Office Action, and further in view of Yoshimura. Claims 1, 4, 5, 7-9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '656 in view of EP '121. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '656 in view of EP '121 and further in view of Yoshimura. Claims 10 and 13 are rejected under 35 U.S.C. §103(a) over EP '121 in view of Sadatoshi and either Yamamoto, JP '656 or Yoshimura.

Applicants traverse.

Distinctions of the invention over the applied art have been placed before the Examiner in the Amendments filed January 13, 2003 and June 25, 2002. The inability of the applied art to allege *prima facie* obviousness has been fully set forth in these Amendments. For the sake of brevity, the arguments and/or evidence set forth in the prior amendments will not be repeated here.

Unexpected Results

If one assumes *arguendo* that the applied art is sufficient to allege *prima facie* obviousness, this obviousness is fully rebutted by unexpected results. These unexpected results are discussed below.

The present invention is typified by claim 1:

1. A propylene/1-butene random copolymer composition comprising 50 to 95% by weight of a propylene/1-butene random copolymer (A) and 5 to 50% by weight of a low-density polyethylene (B), the composition being for an extrusion coating,

said propylene/1-butene random copolymer (A):

(1) comprising 60-90 mol% of structural units derived from propylene and 10-40 mol% of structural units derived from 1-butene;

(2) exhibiting a melt flow rate measured at 230°C under a load of 2.16 kg in accordance with ASTM D 1238 of 0.1 to 40 g/10 min;

(3) having a molecular weight distribution (Mw/Mn), measured by gel permeation chromatography (GPC), of up to 3;

(4) having a B-value, being a parameter indicating a randomness of copolymer monomer chain distribution, of 1.0 to 1.3;

(5) has a melting point T_m , measured by a differential scanning calorimeter, of 60 to 140°C,

said melting point, T_m , and a content of 1-butene structural units, M (mol%), satisfying the relationship:

$$-2.6 M + 130 \leq T_m \leq -2.3 M + 155; \text{ and}$$

(6) has a crystallinity measured by X-ray diffractometry, $C(\%)$, said crystallinity and the content of 1-butene structural units, M (mol%), satisfying the relationship:

$$C \geq -1.5 M + 75, \text{ and}$$

said low-density polyethylene (B):

(1) exhibiting a melt flow rate measured at 190°C under a load of 2.16 kg in accordance with ASTM D 1238 of 1 to 25 g/10 min; and

(2) having a density of 0.915-0.935 g/cm³.

Table 1 at page 38 of the specification compares two inventive examples (specifically 1 and 2) and comparative examples (specifically 2 and 3) having the same components and some corresponding properties, but differing in their M_w/M_n and B value. One readily sees that various advantages result from the use of a copolymer (A) having the claimed M_w/M_n and B values.

The present invention thus leads, among other things, to better slip properties, to better long slip properties, to better blocking resistance, to better blocking time resistance, to better heat sealing bonding strength, and to better hot tack.

The present invention particularly improves haze and gloss properties.

The haze values for inventive examples 1 and 2 (1.3 and 1.9, respectively) are much lower than comparative examples 2 and 3 (2.2

and 3.0, respectively). A gloss increase of at least 30% can therefore be derived from the data in Table 1.

The unexpectedness of the better gloss and excellent haze values of the invention arises for several reasons. It is conventionally believed that a blend of different types of polymers (such as the propylene and ethylene based polymers of the invention) have inferior compatibility compared to a blend of the same type of polymers (two propylene-based polymers such as set forth in EP '121). This inferior compatibility is expected to yield poor gloss, to yield poor haze and to yield long time haze, since optical characteristics such as gloss and haze predominantly depend on compatibility.

A person having ordinary skill would therefore have no expectation that a copolymer composition of two different types of polymers (propylene copolymer (A) and polyethylene (B), as in the invention) would result in the same or improved optical properties.

These improved optical properties are needed for typical uses such as in food wrap film, where transparency (low haze) and gloss improves the commodity value. In general, the more transparent a film is, the more value it has. For example, for a wrap film to cover a chocolate box (a typical application of the invention), no one would select a box where the design is not visible because the wrapping film has poor transparency.

Unexpected Results Over JP '656

When considering JP '656, fundamental differences can be observed in the catalyst system and melting temperature. The copolymer (A) of the invention and the composition of JP '656 moreover differ in molecular weight distribution (Mw/Mn) and B values set forth under numerals (3) and (4) in claim 1.

The invention thus improves gloss and reduces haze, which defines over the laminating polymer of JP '656.

Unexpected Results Over EP '121

The gloss values of the invention demonstrate unexpected results over EP'121. The present invention achieves gloss values of 134% and 128%. This shows considerable improvement over the gloss values in Tables 4 and 5 of EP '121, which pertain to compositions most comparable to examples 1 and 2 of the present invention. The most suitable comparative examples of EP '121 are examples 7, 10, 13 and 15, because these examples use a propylene/1-butene random copolymer having the same propylene and 1-butene content as the PBR-(1) used in inventive examples 1 and 2. These examples in EP '121 also show Mw/Mn, B values, Tm and crystallinity which almost fully correspond to PBR-(1). The absolute gloss values of the present invention, however, are higher than in the corresponding examples of EP '121.

The ratio of PBR used in the examples of EP '121 (75%) also comes very close to the ratio of the ratio of inventive example 2. Excellent haze values can moreover be achieved with present invention, which are partially better than those observed for the relevant examples of EP '121. For example, example 15 at Table 5-II of EP '121 has a haze value of 2.4 (substantially higher than the 1.9 haze value of example 2 in Table 1 at page 39 of the specification).

EP '121 therefore fails to demonstrate how the gloss and haze values of the invention can be obtained. Thus the advantages of the invention are clear.

In summary, even if EP '121 is used as a primary reference and JP '656 is used as a secondary reference (and vice versa), the combined teachings of these references fail to render obvious the claimed copolymer composition that exhibits such amazingly excellent physical properties such as slip and laminate moldability (neck-in).

Unexpected Results Over Yamamoto

Further to the distinctions over the prior art of record, applicants note that Yamamoto only uses low density polyethylene. Yamamoto is not relevant to the inventive PBR copolymer (A) because the blend of Yamamoto contains a copolymer of ethylene, an α -olefin of 4 or more carbons and LDPE. One has no expectation that the

blend of different types of polymers (PBR and LDPE) would show good optical characteristics. There is thus no basis to use Yamamoto as either a primary or secondary reference.

Unexpected Results Over Sadatoshi

Sadatoshi describes the melt flow rate of PBR copolymer. Sadatoshi fails to teach or suggest LDPE (Component B). Although Sadatoshi teaches transparency, crystalline ethylene polymer is used in an amount as small as 0.01-4 wt%. When the amount goes over 4 wt%, the transparency is reduced. See column 3, lines 47-49 of Sadatoshi. One cannot thus be motivated by Sadatoshi to expect improved gloss properties when PBR (A) is combined with LDPE (B).

Unexpected Results Over Sugano

Sugano teaches metallocene PBR. Sugano fails to disclose or suggest the use of LDPE with PBR, and Sugano thus cannot be used as a primary or secondary reference. One cannot thus be motivated by Sugano to expect improved gloss properties when PBR (A) is combined with LDPE (B).

Unexpected Results Over Yoshimura

Yoshimura discusses that LDPE can contain an α -olefin. Yoshimura is completely silent as to optical properties. The

inventive optical properties are thus a clear unexpected result over Yoshimura.

Conclusion of Unexpected Results Analysis

The applied art fails to allege *prima facie* obviousness over the invention, and unexpected results fully rebut any obviousness that can be alleged. These unexpected results, set forth in the specification, demonstrate clear advantages of the critical optical properties of gloss and haze. These superior optical properties yield a film that has clear qualitative and competitive advantages over the conventional art packaging films.

These rejections are accordingly overcome and withdrawal thereof is respectfully requested.

CONCLUSION

The Examiner is respectfully requested to enter this Reply After Final in that it raises no new issues. Alternatively, the Examiner is respectfully requested to enter this Reply After Final in that it places the application in better form for Appeal.

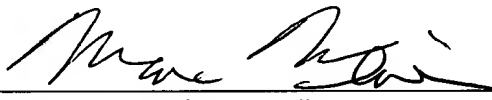
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an


interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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